MINI XMOD 1.5

Meta Media Productions

Documentation

Applicable to both 1.5 and 1.7 versions

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MINI XMOD

Load the program (using LOAD "") and RUN. At this point you will be presented with an identifying page and a brief outline of options available on the primary loop. I have attempted to make the program self documenting , however in the primary loop there are too many options to display. While the first page is on screen, do your phoning. When you hear the other modem, touch any key. At this point you will enter the primary loop where you have the following options.

Simplex Toggle.........Shift/D
Control Character......Shift/1
Modem Control..........Shift/Y
Save Toggle............Shift/T
Up/Down Loading........Shift/3
Quit (all functions)...Shift/NewLine
View Data Rem..........Shift/4
Save Page..............Shift/9
Initialize Files.......Shift/2

Usually hitting the ENTER key a couple of times is enough to start the remote system.

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FUNCTION DESCRIPTIONS

Quit (S/NL) In every part of the program if you wish to quit what you are doing, Shift/Newline will return you to the next higher function (or to Basic). When you wish to return to Basic from the primary loop, S/NL will prompt you with "SAVE FILES (Y/N)?" If you change your mind, S/NL will put you back into the primary loop. If you choose "N", the basic area will be left unchanged. If you choose "Y", the data remark will be shortened to the actual length of the data, and you will be prompted to start your tape recorder. Note: If you have not initialized a data remark (See INIT Files), the program will detect this and merely quit.

Simplex Toggle (S/D) Shift/D toggles the display of what you type off and on. Most Bulletin Boards will echo back to you whatever you enter. This is the function to use to avoid duplicate letters on the screen.

Initialize Files (S/2) In the primary loop S/2 will create a REMark in the Sinclair Basic area. The length of the REM (and hence the amount of data which may be saved) depends upon the version of Mini Xmod you are using. The 16K version creates a Data Rem 11K+ long; the 24K version creates a Data Rem 14K+ long. (See the Memory Maps) Before saving any data, (by S/T,S/9, or Xmodem) you must initialize the files.

Save Toggle (S/T) In the primary loop S/T will cause "SAVE TOGGLE ON" to be displayed on the bottom line. This command causes all input and output to be saved in the data remark. There is a test built in to tell you when the Remark is full. Note: You must Initialize Files before using S/T.

Save Page (S/9) In the primary loop you can save an entire page with Shift/9. When you do this you will see displayed across the bottom of the screen (for as long as you hold the keys down), the page number, and the number of bytes remaining in the data Rem (in hexadecimal). Note: you must initialize the files before using this function.

View Data Remark (S/4) In the primary loop you can view whatever information is in the data Rem by using the S/4 command. You will be prompted with "(A)scii or (S)inclair file?". A mistake at this point will get you a screen full of garbage. After each screen is displayed, you have the option of printing the screen, going to the next screen, or quitting.

Modem Control (S/Y) There are different versions of Modem Control depending upon which modem you use.

Westridge S/Y will cause "MODEM CONTROL: (H)ANGUP (C)ARRIER" to be displayed. You may use this function to turn off the carrier, so you can dial once again. Note that returning to basic from the primary loop also shuts off the carrier. When you hear the other modem start, S/Y followed by "C" allows you to communicate.

ByteBack S/Y will cause "MODEM CONTROL: (A)NSWER (O)RIGINATE" to be displayed. The primary use of this option would be in arranging direct Sinclair to Sinclair connections, as opposed to Sinclair to bulletin board.

In both versions the modem is initialized to Originate mode. Because the Xmodem protocol directly specifies 8 data bits, 1 stop bit and no parity, I have not provided for other parameters in software. If you wish to use Mini Xmod on a board which uses other protocols, see the section Changing Parameters.

Changing Parameters Both the Westridge and the ByteBack Modems use the Intel 8251 UART chip. The parameters are controlled by a mode word, which for the Westridge is at 18222 (472E Hex). The ByteBack mode word is at 18226 (4732 Hex). Further information about these parameters can be found in Intel data sheets, however here are several of the more common instances.

Westridge (18222)

Data Bits	Stop Bits	Parity	Mode Word	
8	1	none	4F Hex.	79 Decima
7	1	even	7B	123
7	1	odd	5B	91
5	2	even	F3	243

ByteBack (18226)

Data Bits	Stop Bits	Parity	Mode Word	
8	1	none	4E Hex	78 Dec
7	1	even	7A	122
7	1	odd	5A	90
5	2	even	F2	242

For example, to set the Westridge version of Mini Xmod to 7 data bits, 1 stop bit, and even parity; Load Mini Xmod and then Poke 18222,123 and then RUN to transfer the program to its proper area. Note that Xmodem will not work properly with any setting other than 8 Data bits, 1 Stop bit & no parity.

CONTROL CHARACTERS (S/1)- There are several different ways to send control characters. (newline) is Control-M. There are several commonly used control characters which can be sent using just the SHIFT key. These are Cntrl-K, Cntrl-J, Cntrl-L, & Cntrl-I (using the Arrow keys) and Cntrl-S using Shift/S.

Control characters from A-Z may be sent using S/1 as well. When you use this, you will see Control Character displayed across the bottom of the screen.

Cntrl. Char. Summary

Newline (enter) - Cntrl-M
Shift/8 - Cntrl-I
Shift/7 - Cntrl-K Alert
Shift/6 - Cntrl-J
Shift/5 - Cntrl-H
Shift/S - Cntrl-S Suspend
Shift/1 - Cntrl-(A to Z)

Sinclair to ASCII Mapping (& back)

One of the more interesting quirks of the Sinclair computer is that it doesn't use ASCII like the rest of the world. This means that to communicate with the outside world, the terminal program has to translate Sinclair codes into ASCII codes & viceversa. The numbers and letters are straightforward, but there are some symbols in each which the other doesn't have. These two tables show how I have mapped these oddball symbols.

Sinclair to ASCII (Sending)

S/Q	%
S/W	!
S/E	@
S/R	&
S/A	↑
S/F	[
S/G	]
S/H	#

ASCII to Sinclair (Receiving)			Sinclair Code (Decimal)
!	▐		133
#	▒		8
%	▚		134
&	▓		149
@	▖		4
[	(		16
\	/		24
]	)		17
_ (underline)	-		22
'	"		11
{	(	(inverse)	144
|	:	"	142
}	)	"	145
↑	▀		3
~	▓		137

Cntrl(A-Z) maps to the inverse letter.

What is Xmodem?

Sometimes called the Christensen protocol, XMODEM is a method of transferring files over unreliable telephone lines. A reliability of 90% + is claimed. Basically the technique transfers 80(hex) bytes, tells the other computer; this is the nth block of data & this is the checksum; do you agree? If the sender and the receiver compute different checksums, a block of data is retransmitted a maximum of 10 times (after which the program aborts). There is a built in timeout each time a block repeats to ensure the synchronization of the two systems.

When the sender and receiver agree that the last block was correctly received, the next block is sent. More detailed info can be found on many CP/M systems in a file called "MODEMPRT.OQ1" .

Note that MINI XMOD will upload a Sinclair program up to the display file (ie. not the variables area). Also, besides the checksum technique of catching errors, Xmodem can use Cyclic Redundancy Check (CRC). This is not implemented in Mini Xmod. For this reason when sending a file to Xmodem you need to specify " RC ", for receive with checksum.

UP/DOWN LOADING (S/3) - This command will present you with the message " (U)P   (D)OWN   (T)RANSFER   QUIT   ". Once you have told the other system what you are doing, you need only touch U or D to initiate a transfer of files. Note that if you are downloading (ie. sending a file from the remote system to your computer), you must have initialized the files (by using S/2). There is a memory test built into the Download option, so that if you tell the remote system to send you a file which is longer than your Data REMark, Mini Xmod will stop downloading and tell you so.

When you have downloaded a Sinclair (ZX81/TS1000) program, the (T)ransfer function can be used to put the program into the Sinclair basic area so that it can be run.

There is a timeout of 10 seconds built into Xmodem, so every once in a while (when first downloading & on repeating blocks), the program will appear to be doing nothing. However if nothing happens for longer periods of time, there is an escape function built into Xmodem. It will not always work because sometimes the program is busy testing ports and suchlike, however if it appears that something has gone fatally wrong with a file transfer S/NL will usually get you out to the primary loop. When you invoke this escape, all data is lost.

USING XMODEM

When you are signed onto a bulletin board which uses CP/M, you must go to the files section (Usually by entering "F" at the command prompt). The system will then do some housekeeping, and present you with the CP/M prompt (A1>). To invoke Xmodem you need only to type the word "XMODEM". This tells CP/M that the Xmodem file needs to be loaded. Then you have to tell Xmodem what you want it to do; your options are " S" for Send (from the remote system) or " RC" for Receive (with checksum protocol) from your system.

The only other information Xmodem needs are the drive where the file is located and the filename and filetype, (See Using CP/M) such as " A2: MODEMPRT.001"

USING XMODEM (cont'd)

Once you have typed in this information, the remote system will do some housekeeping (tell you which version of Xmodem it is, tell you how long it will take to transfer a given file, or on which drive it will be received), then you invoke S/3 in Mini Xmod and touch U or D. The transfer is automatic from there on. The program will tell you when the transfer is complete or aborted.

There is the odd bulletin board around using Xmodem which is not CP/M based. On these systems usually the transfer is menu driven; the remote system will tell you when to invoke the transfer on your system.

TYPICAL EXCHANGES

Once you are into the CP/M files section downloading a file might proceed thus:

```
     A1> XMODEM S XMODEM.HLP
CP/M prompt   Tell it to send
     Invoke Xmodem            The Filename & Filetype
```

If the file was not on A1:, the system would respond;

```
     ***REQUESTED FILE NOT FOUND***
```

You would then have to specify which drive the file was on thus:

```
     A1> XMODEM S B5: XMODEM.HLP
CP/M prompt   Send from B5:
     Invoke Xmodem           The Filename & Filetype
```

At this point the system would typically respond:

```
     Xmodem V 7.3
     Send time  3 minutes 44 seconds
     File open  Ready to Send
```

At this point, you go to S/3 in Mini Xmod and touch "D" to transfer the file.

TYPICAL EXCHANGES (cont'd)

To upload a file you first load Mini Xmod and transfer it to it's appropriate address. Then return to basic and load the file you wish to upload. This can be any Sinclair program. Note that Mini Xmod does not transfer the Variables area. What is saved is the basic area from 407D to the Display File.

Alternatively, one could invoke the Write Utility to create a file for uploading. At any rate, when the information to be uploaded is in the basic area, start Mini Xmod.(See Memory Maps for the starting addresses if you have forgotten) Must be in Slow mode

At this point you need to sign onto the Bulletin Board and get into the CP/M files section. Uploading a Sinclair program would proceed thus:

```
     A1>  XMODEM RC  CMOSUTIL.SIN
CP/M prompt       Tell it to receive (with checksum)
     Invoke Xmodem
                                  Program Name & Filetype
```

At this point the system would typically respond:

```
Xmodem V 9.0
Checksum Enabled
File will be received on B0:
Cntrl-S to pause, Cntrl-X to cancel
File open   Ready to receive
```

At this point you go to S/3 in Mini Xmod and touch "U" to initiate the file transfer on your end. The program will tell you when the transfer is done, or of any problems.

Note: Many versions of Xmodem have Help files built in.

```
A1> XMODEM (NEWLINE)
```

Simply entering Xmodem without any further data will induce the program to type out its help file.

USING CP/M

CP/M is one of the more popular operating systems around. Part of this success is due to the CBBS programs which allow the remote operation of the CP/M system with all the options that entails. A complete description of CP/M is beyond the scope of this document (see Suggested Reading List); however there are some very basic things you need to know.

When CP/M expects a command from you, it will prompt you with A1>. This also tells you that you are in Drive A, User Area 1. You may change to another Drive and User Area by typing in " User B5 ". Note that spaces are significant in using these command words. CP/M uses spaces to know where the ends of commands are. If you tell CP/M to do something that doesn't make sense to it, the system will echo your command with a question mark.

There are several built in commands which you can always execute in CP/M, the others have to be loaded in from the disk drive (if they are implemented). Among the built in commands are "DIR ", which stands for DIRectory& "TYPE ", which will type out a file for you. You can also ask to see a specific Drive & User Area by entering "DIR E4: ", for example. To have the entire files area displayed, enter "DIR A:*.* $AD". To exit the CP/M system one usually uses "BYE ".

Files are stored in CP/M with a Name and a File type. Typical examples are;

XMODEM.HLP	(Help)
READLISA.BAS	(Basic)
MEXREF.DOC	(Document)
BOOTASM.SIN	(Sinclair)

The FileName may be up to 8 characters long, and the FileType 3. There are a group of non-alphabetical characters which may not be used in FileNames. The Name and Type must be seperated by a period. There is a set of standardized Types in use which you can find in the reading list.

SUGGESTED READING ON CP/M

Osborne CP/M User Guide - T.Hogan
The CP/M Handbook - Rodnay Zaks
Mastering CP/M - A.Miller
CP/M Primer - Murtha & Waite
CP/M Revealed - J.Dennon
Using CP/M - Fernandez & Ashley
The Programmers CP/M Handbook- A. Johnston Laird

MEMORY MAPS

16K Version

0000	ROM
2000	ROM Shadow
4000	System Variables
407D	Data REMark
6F48	
6F49	DFile
7262	Vars
72F0	Ramtop
7300	Mini Xmod
7F40	
7FFF	End of memory

Starting Addresses:

Westridge- 31492
ByteBack - 31515

24K Version

0000	ROM
2000	UNUSED ROM Shadow
3300	Mini Xmod
3F40	Unused
4000	System Variables
407D	Data REMark
7C48	
7C49	DFile
7F62	Vars
7FFF	Ramtop

Westridge- 15108
ByteBack - 15131

Note that the program uses some memory areas in the system variables (Pr.Buff. & MemBot) for the temporary storage of pointers & flags.

MINI-XMOD 1.5 FUNCTION SUMMARY

BASIC OPERATION

. LOAD "" and RUN. Hit any key.

2. Press SHIFT Y then H to shut off carrier tone.

3. Press SHIFT 2 to INITIALIZE FILES (clear)

4. Press SHIFT D to switch to Full Duplex

5. Press SHIFT Y

6. Phone BBS and listen for carrier tone.

7. When carrier tone is heard, press C to turn on modem carrier.
8. Press ENTER 1 to 3 times to start remote BBS.

9. Proceed as normal.

SAVE FUNCTIONS

SAVE TOGGLE (SHIFT T) will save all screen display to the capacity of memory or until SAVE TOGGLE (SHIFT T) is turned off. SAVE TOGGLE can be used continuosly or intermittently to collect data.

SAVE PAGE (SHIFT 9) is used to save one full screen display at a time.

VIEWING DATA

1. Sign off of BBS then press SHIFT Y then H to shut off modem carrier.

2. Press SHIFT 4 then S when prompted.

3. Follow instructions at bottom of screen to print or continue reading data.

SAVING DATA

1. Press SHIFT/ENTER then Y when prompted.

2. Follow screen directions.

UPLOADING/DOWNLOADING

MINI XMOD 1.5 will allow Timex programs to be up/down loaded to a remote BBS and the programs will RUN. Programs with data stored in string varibles Will have data removed. Non-Timex programs and files can be downloaded, stored, and transfered to other BBS but they cannot be transferred to the Sinclair Basic area and RUN. They can be LLIST to allow for manual conversion to Sinclair Basic.

UPLOADING

1: Load MINI XMOD 1.5 and RUN.

2. Press any key.

3. Press SHIFT/ENTER

4. Press N when prompted.

5. Press NEW to move MINI XMOD 1.5 above RAMTOP.

6. Load Timex software.

7. Enter as a DIRECT COMMAND, RAND USR (the address of MINI XMOD 1.5 as determined by your system configuration as detailed on page 11 of main documentation)

8. Refer to page 6 of main documentation for XMODEM procedures. Check indivual BBS XMODEM HELP FILES for system specific instructions.

DOWNLOADING

1. Follow procedures in Basic Function Summary.

2. Refer to page 7 of main documentation and pay particular attention to page 10, using CP/M to ultilize directory functions of BBS.

3. Press SHIFT 3 then D to download program or file.

4. When download is complete press T only if program is Timex. This will transfer program to the Sinclair Basic Area and allow it to RUN.

Generally accepted BBS courtesy requires that all users properly log off at the end of a session. Failure to do so not only disrupts some systems, it can result in loss of access.

This software fully supports both the MEMOTECH CENTRONICS INTERFACE with full sized Centronics printer and the TIMEX 2040 printer.

NOTE

If you notice an inverse "J" at the beginning of each line, it indicates that the BBS is sending "Line Feeds". This can be toggled off usually through instructions included in the sign on menu.

ADDENDUM

The Mini Xmod 1.7 versions require that you first hit RUN then activate the software using RAND USR X where X is the starting address displayed in the listing when the program is loaded.

TEXTWRITING

1. Load program, Run, then call program with appropriate RAND USR command.

2. Toggle the DISPLAY to ON (SHIFT D).

3. HANGUP modem (SHIFT Y-H).
4. Activate SAVE TOGGLE (SHIFT T).

5. Write text.

6. De-active SAVE TOGGLE (SHIFT T).

7. Press SHIFT ENTER twice.

8. When the SAVE FILES? prompt appears, press Y.

9. When the save pattern appears on the screen, press the BREAK key.

10. Recall Mini-Xmod using appropiate RAND USR command.

11. DO NOT initialize or text will be lost. Your text can now be uploaded in the normal manner.